

Claims

1. A node for a fiber optic communication network, the node including a first device for converting a first optical signal at a first frequency carried by the network into a first electrical signal, a second device for demodulating from the first electrical signal first information modulated on the first optical signal, a third device for modulating on a second electrical signal second information, a fourth device for converting the second information modulated on the second electrical signal into a second optical signal at the first frequency, a fifth device for providing a third optical signal at a second frequency, the third optical signal having third information modulated on it, and a sixth device for multiplexing the second and third optical signals and placing the multiplexed second and third optical signals on the network.
2. The apparatus of claim 1 wherein the network further carries a fourth optical signal at the second frequency, the apparatus further including a seventh device for converting the fourth optical signal into a third electrical signal, and an eighth device for demodulating from the third electrical signal fourth information modulated on the fourth optical signal.
3. The apparatus of claim 2 further including a ninth device for providing a fifth optical signal at a third frequency, the fifth optical signal having fifth information modulated on it, the sixth device multiplexing the second, third and fifth optical signals and placing the multiplexed second, third and fifth optical signals on the network.
4. The apparatus of claim 3 wherein the network further carries a sixth optical signal at the third frequency, the apparatus further including a tenth device for converting the sixth optical signal into a fourth electrical signal, and an eleventh device for demodulating from the fourth electrical signal sixth information modulated on the sixth optical signal.
5. The apparatus of claim 1 further including a seventh device for providing a fourth optical signal at a third frequency, the fourth optical signal having fourth information modulated on it, the sixth device multiplexing the second, third and

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fourth optical signals and placing the multiplexed second, third and fourth optical signals on the network.

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6. A fiber optic network including the node of claim 1, 2, 3, 4 or 5 and further including a second node, the second node including a first device for
5 converting a first optical signal at a first frequency carried by the network into a first electrical signal, the second node further including a second device for demodulating first information from the first electrical signal modulated on the first optical signal, the second node further including a third device for modulating second information on a second electrical signal, and the second node further including a fourth device for
10 converting the second information modulated on the second electrical signal into a second optical signal at the first frequency.
7. The apparatus of claim 6 wherein the network further carries a third optical signal at a second frequency, the second node further including a fifth device for converting the third optical signal into a third electrical signal having third
15 information modulated on it.
8. The apparatus of claim 7, the second node further including a sixth device for modulating fourth information on a fourth electrical signal, and the second node further including a seventh device for converting the fourth information modulated on the fourth electrical signal into a fourth optical signal at the second frequency and
20 placing the multiplexed second and fourth optical signals on the network.
9. A node for a fiber optic communication network, the node including a first device for converting a first optical signal at a first frequency carried by the network into a first electrical signal, a second device for demodulating first information from the first electrical signal modulated on the first optical signal, a third
25 device for modulating second information on a second electrical signal, and a fourth device for converting the second information modulated on the second electrical signal into a second optical signal at the first frequency.
10. The apparatus of claim 9 wherein the network further carries a third optical signal at a second frequency, further including a fifth device for converting

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the third optical signal into a third electrical signal having third information modulated on it.

11. The apparatus of claim 10 further including a sixth device for modulating fourth information on a fourth electrical signal, and a seventh device for converting the fourth information modulated on the fourth electrical signal into a fourth optical signal at the second frequency and placing the multiplexed second and fourth optical signals on the network.

- Sub A1> 12. The apparatus of any preceding claim wherein the fiber optic network includes a closed loop optical fiber, one of the first-mentioned nodes and at least one of the second nodes coupled to the closed loop optical fiber.

13. The apparatus of any preceding claim wherein the fiber optic network includes two closed loop optical fibers for carrying the first optical signal in opposite directions, each node being coupled to both optical fibers.

14. The apparatus of any preceding claim wherein the two closed loop optical fibers also carry the third optical signal in the two opposite directions.

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